

APPLICATION FOR
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Title of the Invention: PERSONAL INFORMATION MANAGEMENT
APPARATUS, PERSONAL INFORMATION
MANAGING METHOD, AND STORAGE
MEDIUM AND PROGRAM THEREFOR

PERSONAL INFORMATION MANAGEMENT APPARATUS, PERSONAL
INFORMATION MANAGING METHOD, AND STORAGE MEDIUM AND
PROGRAM THEREFOR

5 Background of the Invention

Field of the Invention

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The present invention relates to a personal
information management apparatus and a personal
information managing method for managing personal
10 information, and a storage medium and a program
therefor, and more specifically to a personal
information management apparatus and a personal
information managing method for managing personal
information about a person by dividing the
15 information into plural sets of different
situations, and a storage medium and a program
therefor.

Description of the Related Art

20 Recently, efficient management of personal
information has become more and more important in
daily life as well as in business. Personal
information refers to, for example, common
information such as an address book, telephone book,
25 schedule information, etc. that have been managed

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for management of the schedule of an operator, and communication means for communication between the users, and has the function of reflecting a setting result on the schedule database of each user.

5 However, in the personal information management apparatus (personal agent) such as the above mentioned information terminal device, there has been the following problem in processing the personal information.

10 Users have respective status and situations in their offices, home, etc. Especially, mixing up private information with public information causes a problem of the business security, infringement of privacy, etc. Therefore, users have no alternative
15 but to use a plurality of personal information management apparatus (personal agent) and manage the information as different persons.

 On the other hand, in the method of processing information as completely different persons, all
20 personal information has to be separately managed as each person who has set his or her own personal information, thereby failing in collectively managing the personal information which is the first object of the personal information management
25 apparatus (personal agent) for managing the

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personal information.

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5 The users request to classify the information to be managed by a plurality of personal information management apparatuses (personal agents) into an information group to be shared and another information group not to be shared so that the information to be shared can be equally accessed by any personal information management apparatus (personal agent).

10 Furthermore, if the plurality of personal information management apparatuses (personal agents) are independently used, it is necessary to separately use an information terminal for each personal information management apparatus (personal agent).
15 Thus, it is almost impossible to use the plurality of personal information management apparatuses (personal agents) through one information terminal.

20 Although the function of communications among a plurality of personal information management apparatuses (personal agents) can be realized as the information terminal device disclosed by Japanese Patent Publication No.2000-67118, a method of processing the personal information about the
25 same person by dividing the information into groups

for different situations has not been provided. Therefore, unless a user personally switches his or her situation, appropriate information cannot be selected from among plural pieces of personal information.

Summary of the Invention

The present invention has been developed to solve the above mentioned problems, and aims at providing a personal information management apparatus and a personal information managing method capable of collectively managing personal information about different situations, a storage medium and program therefor.

The personal information management apparatus according to the present invention is a personal information management apparatus for electronically managing users' personal information, and includes a personal information database selection unit and a processing unit.

According to the first aspect of the present invention, the personal information database selection unit selects a personal information database based on predetermined rules from the personal information storage unit including a

plurality of personal information databases respectively storing personal information about different situations of a user. The processing unit processes the personal information database selected by the personal information database selection unit such that the personal information can be read and written.

Brief Description of the Drawings

FIG. 1 shows the entire configuration for explanation of the personal information management apparatus and its vicinity to which the present invention is applied;

FIG. 2 shows the configuration of the function according to an embodiment of the personal information management apparatus (personal agent) to which the present invention is applied;

FIG. 3 shows the first embodiment of the personal information management apparatus (personal agent) according to the present invention;

FIG. 4 shows the function of a personal information management apparatus (personal agent) 200 shown in FIG. 3;

FIG. 5 is a flowchart of the flow of operating process of the synchronous functions of detecting a

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change and synchronizing the contents;

FIG. 6 shows the second embodiment of the personal information management apparatus (personal agent) according to the present invention;

5 FIG. 7 shows the function of a personal information management apparatus (personal agent) 300 shown in FIG. 6;

FIG. 8 is a flowchart of the operating process according to the second embodiment when a PC 331 and a PDA 301 are connected and synchronized;

10 FIG. 9 shows the configuration of a personal information management apparatus; and

FIG. 10 shows the process of loading a program according to the present invention into a computer.

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Description of the Preferred Embodiments

The embodiments of the present invention are described below in detail by referring to the attached drawings.

20 The present invention has the following configuration to solve the above mentioned problems.

The personal information management apparatus (personal agent) for managing users' electronic personal information is provided with the function
25 of managing plural sets of personal information

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about different situations and the function of selecting and using the personal information based on the user-defined rules.

5 The rules for selection of user personal information in the personal information management apparatus (personal agent) are realized as the rules for selecting the personal information depending on the use time.

10 The rules for selection of user personal information in the personal information management apparatus (personal agent) are also realized as the rules for selecting the personal information depending on the path and method for access to the network of a user terminal.

15 The rules for selection of user personal information in the personal information management apparatus (personal agent) are also realized as the rules for selecting the personal information by referring to the personal information indicating
20 the situation and status in the user personal information.

 The function of managing plural sets of personal information managed by the above mentioned personal information management apparatus (personal
25 agent) is realized using a plurality of personal

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information management apparatuses (personal agents) for respectively managing a set of personal information and an integration agent for integrally managing these personal information management apparatuses (personal agents).

Furthermore, the plural sets of personal information managed by the above mentioned personal information management apparatus (personal agent) depend on each other. When a part of one set of personal information is changed, another set of personal information specified by a user is also changed, which is referred to as a personal information synchronization function.

The personal information management apparatus (personal agent) is mounted in a server in a network, and manages the personal information by answering the request from a terminal.

Otherwise, the personal information management apparatus (personal agent) is mounted directly on a terminal of a user, and accesses other terminals and personal information management apparatuses (personal agents) through a network.

The personal information management apparatus (personal agent) is also provided with the function of synchronizing the information managed by the

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personal information management apparatuses
(personal agents) of other users.

The personal information management apparatus
(personal agent) can be used no an organization
5 such as a division, department, or enterprise as
well as an individual person.

That is, according to an aspect of the present
invention, the personal information management
apparatus according to the present invention
10 electronically manages users' personal information,
and comprises: a personal information database
selection unit for selecting a personal information
database based on a predetermined rules from a
personal information storage unit containing a
15 plurality of personal information databases
respectively storing personal information about
different situations of the same user; and a
processing unit for processing the personal
information database selected by the personal
20 information database selection unit such that
personal information can be read and written.

It is desired that the personal information
management apparatus according to the present
invention further comprises a clock unit for
25 outputting the current time data so that the rules

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are defined based on the time data output by the clock unit.

It is also desired that the personal information management apparatus according to the present invention further comprises a transmission/reception unit provided in a network for transmitting and receiving data to and from a information processing terminal through the network so that the personal information database selection unit can select the personal information database through the network or directly select the personal information database.

It is further desired that the personal information management apparatus according to the present invention defines the rules based on the information received by the transmission/reception unit about the access path in the network from the information processing terminal.

It is further desired that the personal information management apparatus defines the rules according to the information which is received by the transmission/reception unit and designates the information processing terminal.

It is further desired that the personal information management apparatus according to the

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present invention comprises a status information input unit for inputting any user status information in the user status information containing the situation of a user and the status of a user, and the rules are defined according to the user status information input through the status information input unit.

It is further desired that the personal information management apparatus according to the present invention comprises: a personal information nonmatching detection unit for detecting that the personal information about predetermined items common to the two personal information databases stored in the personal information storage unit is different from each other; and a personal information nonmatching notification unit for informing of the difference detected by the personal information nonmatching detection unit.

It is further desired that the personal information management apparatus according to the present invention comprises a personal information synchronization unit for amending one piece of different personal information detected by the personal information nonmatching detection unit to match the other piece.

FIG. 1 shows the entire configuration for explanation of the personal information management apparatus according to the present invention and its vicinity.

In FIG. 1, a personal information management apparatus 1 is connected to an information processing terminal 4 through a network 2.

The personal information management apparatus 1 is also connected to a personal information database 31 through the network 2 or directly.

The personal information management apparatus 1 comprises a personal information database selection unit 11, a processing unit 12, a clock unit 13, a transmission/reception unit 14, a situation information input unit 15, a personal information nonmatching detection unit 16, a personal information nonmatching notification unit 17, and a personal information synchronization unit 18, and electronically manages the personal information of users.

The personal information database selection unit 11 selects the personal information database 31 based on predetermined rules from a personal information storage unit 3 provided with a plurality of personal information databases 31

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which are stored for each situation and contain personal information about different situations of the same user.

The processing unit 12 processes the personal information database 31 selected by the personal information database selection unit 11 such that the personal information can be read and written.

The clock unit 13 outputs the current time data (information about year, month, day, minute, and second including holiday information such as a day of week, a national holiday, etc.). Based on the time data (day of week, working hours) output by the clock unit 13, the above mentioned rules can be defined. For example, if the time data '2:00 p.m. on Monday' is output, then a rule of an 'employee status' can be defined.

The transmission/reception unit 14 is installed in the network 2, and transmits and receives data to and from the information processing terminal 4 through the network 2. Then, the personal information database selection unit 11 not only directly selects the personal information database 31, but also selects the personal information database 31 through the network 2.

Furthermore, the rule can be defined based on

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the information received by the transmission/reception unit 14 about the access path in the network 2. For example, if it is an access path from a contract provider as a person (privately), then it can be defined as a rule of a private status. If it is an access path from a server of an office of the user, then it can be defined as a rule of an employee status.

The rule can also be defined according to the information which is received by the transmission/reception unit 14 and designates the information processing terminal 4. For example, if the information processing terminal 4 is a PC (personal computer), then the rule can be defined as a rule of an employee status, and if it is a personally owned PC, a rule of a private status can be defined.

The situation information input unit 15 inputs any user status information in the user status information containing the situation of a user and the status of the user. According to the user status information input through the situation information input unit 15, the rule can be defined. For example, according to the time recorder recording the entrance/exit information of the

working information input from a time card recording the information recorded on the time recorder, the rule of an employee can be defined. Furthermore, according to the login information in the host computer of the contract provider of a person (privately), the rule of a private status can be defined.

The personal information nonmatching detection unit 16 detects that the personal information of predetermined items common to the two personal information databases 31 stored in the personal information storage unit 3 is different from each other.

The personal information nonmatching notification unit 17 informs of the difference detected by the personal information nonmatching detection unit 16.

The personal information synchronization unit 18 amends one piece of the different personal information detected by the personal information nonmatching detection unit 16 to match the other piece.

FIG. 2 shows the configuration of the function of the embodiment of the personal information management apparatus (personal agent) according to

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the present invention.

In FIG. 2, a personal information management apparatus (personal agent) 100 comprises a personal information management function 101, a communication function 102, a user I/F 103, an agent I/F 104, a personal information selection function 105, a personal information reference function 106, an information contents accumulation function 107, a permission management function 108, and an extension application execution function 109.

The personal information management function 101 manages and controls the personal information of a user using the personal information selection function 105, the personal information reference function 106, the information contents accumulation function 107, and the permission management function 108.

The personal information selection function 105 determines according to the user-specified rule which personal information the user is to access.

The personal information reference function 106 refers to the personal information of another personal information management apparatus (personal agent) using the communication function 102.

The information contents accumulation function

107 temporarily accumulates the information
obtained by the personal information reference
function 106.

5 The permission management function 108
determines whether or not a reference request from
a user is acceptable.

10 The communication function 102 interprets
various communications protocols when the personal
information management apparatus (personal agent)
communicates with a user and other personal
information management apparatuses (personal
agents), and issues a message to other functions
such as the personal information management
function 101, etc.

15 The user I/F 103 is an interface between a
user and the personal information management
apparatus (personal agent) 100.

20 The agent I/F 104 is an interface for access
from other personal information management
apparatuses (personal agents).

The extension application execution function
109 allows the personal information management
apparatus (personal agent) 100 to perform a plug-in
process. An example of a plug-in process is
25 described later.

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FIG. 3 shows the first embodiment of the personal information management apparatus (personal agent) according to the present invention.

In FIG. 3, the personal information management apparatus (personal agent) 200 is operated in a server 230 through a network (Internet), and constantly waits for access of a user.

A WWW (World Wide Web) browser 221 is an application of a PC 231 used by a user, and accesses the WWW resources in the network (Internet) from the PC 231 connected to the network (Internet).

An LDAP (Lightweight Directory Access Protocol) server 222 and an LDAP server 223 are servers for managing users' personal information, and are operated by servers 232 and 233. They provide personal information for the applications gaining legal access using LDAPS.

The LDAP is configured by a server/client model, and defines a request-response message transfer protocol between a server (directory server) storing directory information and a client accessing it. The LDAP is defined by an RFC (Request For Comments) 1777 and an RFC 1778.

Next, the function of the personal information

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management apparatus (personal agent) 200 shown in FIG. 3 is described by referring to FIG. 4.

In FIG. 4, the user using the personal information management apparatus (personal agent) 200 enters the rule for selection of his or her personal information in a personal information selection unit 203. The personal information selection unit 203 selects at least one appropriate set of plural sets of personal information (a plurality of personal information databases respectively storing personal information for each of the different points of the same user) according to the time, the access path to the network of the user, the working record in the personal information, etc. The rules for the selection are set by the user when he or she starts using the personal information management apparatus (personal agent) 200.

The personal information management apparatus (personal agent) 200 is to be devised to set the rules simply. For example, by using a network access path as a determination reference and allowing a user to input and set the mail address of the provider used personally or in his or her office, it is determined whether the user is

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accessing from his or her office or through his or her own contract provider. When it cannot be determined from the reference provided for the personal information management apparatus (personal agent) whether the user is accessing personally or on business, the user can separately specify the personal information to be prioritized.

The method of selecting the personal information can be used with various other determination references. For example, the public and private information can be determined based on the time, and the information can be switched depending on the working time and the holidays.

According to the embodiment of the present invention, the user can access the personal information management apparatus (personal agent) 200 through the HTTP and the SSL using the WWW browser. Therefore, a user I/F 208 is realized as the function of being invoked by the HTTP server and the CGI program.

Furthermore, according to the embodiment of the present invention, the plural sets of personal information are managed by separate LDAP servers. Therefore, an agent I/F 209 has a function as an LDAP client.

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A personal information reference unit 204 obtains the personal information selected by the personal information selection unit 203 from the LDAP server 222 (FIG. 3) or the LDAP server 223 (FIG. 3) using the agent I/F 209. The referenced information can be accumulated in an information contents accumulation unit 205 for use. The information can be used as the latest information within a time shorter enough than the user information update intervals without asking the source DAP server. In this case, if the user notices that the information in the information contents accumulation unit 205 is too old, it is desired that an explicit instruction can be issued to the personal information reference unit 204 to obtain the latest information.

The personal information management apparatus aims at collectively managing personal information and reducing the load of a user. Therefore, it is desired that a plurality of personal information management apparatuses (personal agents) capable of accessing LDAP servers can automatically amend the inconsistency of data and give instructions to users. The synchronizing function of automatically amending the inconsistency and the function of

In the embodiment described by referring to
FIG. 4, when a user first uses the personal
information management apparatus (personal agent)
200, the user specifies the data having the same
contents as target synchronous data in the data
stored in the LDAP servers 222 and 223 (FIG. 3).
For example, the name, age, etc. of a user are
specified. The personal information management
apparatus (personal agent) 200 monitors a change in
the user-specified target synchronous data when the
data of both servers (LDAP servers 222 and 223) is
obtained.

There are several methods of detecting a change in data. In the embodiment of the present invention, the target synchronous data is to be stored in the information contents accumulation unit 205, and is to be prioritized more than the data in the LDAP servers 222 and 223. The user changes the personal information only through the personal information management apparatus (personal agent) 200. The personal information management apparatus (personal agent) 200 performs a data

updating operation such that the data in the LDAP servers 222 and 223 can be the latest data at the timing of shown in the flowchart in FIG. 5. On the other hand, the data stored in the LDAP servers 222 and 223 is prioritized more than the data which is not target synchronous data. The values obtained from the LDAP servers 222 and 223 are stored in the information contents accumulation unit 205, and are used as cache information for a predetermined time so that the number of times of communications can be reduced.

FIG. 5 is a flowchart showing the flow of the operation of the function of detecting a change and synchronizing the contents.

In step S51, when a request to obtain the information about the target synchronous data is received from a user, it is determined in step S52 whether or not the requested data is set as target synchronous data.

If it is determined in step S52 that the data is target synchronous data (YES in step S52), then the information stored in the target LDAP server is received in step S53, and is compared with the data contents accumulated in the information contents accumulation unit 205 in step S54.

Therefore, if it is determined in step S56 that the data has not been updated after the reference retention period (YES in step S56), then the personal information management apparatus (personal agent) inquires the LDAP server of the latest information and obtains it in step S57, and the information is copied to the information contents accumulation unit 205 in step S58. Then, in step S59, the user is notified of the data contents.

The reference retention period is to be sufficiently shorter than the information update frequency in the LDAP server. If the reference retention period is long, the personal information management apparatus (personal agent) continues notifying the user of its old copied information even after the information in the LDAP server has been updated. If the reference retention period is too short, then the communications to the LDAP server are frequently required to confirm the contents of the data for the LDAP server, thereby prolonging the response time to the user. It is desired that the reference retention period is longer than the information inquiry interval of the user, and shorter than the information update

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interval of the LDAP server.

To realize the non-matching notification function, the personal information management apparatus can allow the user to confirm the information before issuing an instruction to update information to the target synchronous LDAP server in step S55. In this case, the personal information management apparatus (personal agent) first obtains user permission, and transmits a request to update information. The user can set the personal information management apparatus (personal agent) such that the non-matching notification function can work only on important data.

FIG. 6 shows the second embodiment of the personal information management apparatus (personal agent) according to the present invention. FIG. 7 shows the function of the personal information management apparatus (personal agent) 300 shown in FIG. 6.

The function according to the second embodiment is similar to the function according to the first embodiment, but each function is realized by a different units (since each unit shown in FIG. 7 having the same name as the unit shown in FIG. 2 also has the same function, the detailed

explanation is omitted here).

The personal information management apparatus (personal agent) 300 according to the present embodiment is directly mounted in the terminal of the user. Therefore, not only the personal information management apparatus (personal agent) in the network, but also the information terminal connected through a communications device such as a serial port, etc. is also a communications target. Furthermore, the subject which manages each piece of personal information is not a personal information management apparatus (personal agent) in a network such as an LDAP server, but is a schedule management application (scheduler) in a terminal. Therefore, information is obtained and updated in the inter-process communications using a signal. An agent I/F 309 is provided for the communications method.

According to the present embodiment, a user accesses the personal information management apparatus (personal agent) 300 through the PDA 301. The user uses the personal information management apparatus (personal agent) 300 as a synchronizing application of the PDA 301.

The PDA 301 is a portable terminal loaded with

an existing pocket PC and a palm OS, and obtains backup data and installs a new application based on a large-scale information terminal such as a personal computer, etc. According to the present
5 embodiment, data synchronization is performed with other applications through the personal information management apparatus (personal agent) 300.

Each piece of personal information is changed when an application is used in the PC 331 and data
10 is input by the PDA 301. The personal information management apparatus (personal agent) 300 manages schedulers 322 and 323, selects an appropriate scheduler when the user obtains schedule information, and notifies the user of the contents
15 of the data.

Furthermore, when the PDA 301 tries to synchronize with the PC 331, the contents of the data of a PDA 321 are changed based on the contents of the appropriate schedule in the situation.
20 Relating to the selection reference, the time and the connecting method to a network can be used as in the first embodiment.

FIG. 8 is a flowchart of the operation of the second embodiment when the PC 331 and PDA 301 are
25 connected for synchronization.

First, When the PC 331 and the PDA 301 are connected in step S81, the scheduler selected by the PDA 301 is synchronized with the data of the PDA 301 in step S87, and it is checked in step S88 whether or not the scheduler selected by the personal information management apparatus (personal agent) 300 is the same as the scheduler set as a reference scheduler by the PDA 301.

If it is determined in step S83 that they are the same (NO in step S83), then a different point is reflected by both schedulers as in the synchronization of the normal PDA and the scheduler, thereby terminating the synchronization.

On the other hand, if it is determined in step S83 that the PDA 301 is different from the scheduler selected by the personal information management apparatus (personal agent) 300 (YES in step S83), then the personal information management apparatus (personal agent) 300 changes the contents of the data of the PDA 301 into the data with an appropriate scheduler set as a reference scheduler. However, since the PDA 301 has changed the contents of the scheduler selected by itself, it synchronizes the scheduler selected by the PDA to store the update information (refer to step S82).

In step S84, the contents of the data of the PDA 301 are cleared, and the contents of the scheduler selected by the personal information management apparatus (personal agent) 300 are overwritten.

5 Thus, using the second embodiment of the personal information management apparatus (personal agent) as the synchronization program in the conventional PDA appliances, the contents of the PDA can be changed into the contents based on the
10 situation of the user.

 When plural sets of personal information about different situations of the same use are separately used, the user has trouble in managing to switch the plurality of situations using the
15 synchronization functions for conventional individual pieces of information. According to the personal information management apparatus (personal agent) of the present invention, a personal information management apparatus (personal agent)
20 automatically selects the situation based on the settings of the user and presents the result to the user, thereby easily managing the information about a plurality of situations.

 As described above, the embodiments of the
25 present invention have been described by referring

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to the attached drawings. However, the personal information management apparatus according to the present invention is not limited to the above mentioned embodiments so far as the function can be realized. That is, the apparatus can be a device of a single unit, a system or an integrated device formed by a plurality of devices, or a system for performing a process through a network such as a LAN, WAN, etc.

As shown in FIG. 9, the present invention can also be realized by a system comprising a CPU 141, memory 142 such as ROM, RAM, etc., an input device 143, an output device 144, an external storage device 145, a medium drive device 147, a portable storage medium 146, and a network connection device 148 interconnected through a bus 140. That is, the present invention can also realized by providing the memory 142 such as ROM, RAM, etc. storing a program code of the software for realizing the system according to the above mentioned embodiments, the external storage device 145, and the portable storage medium 146 for the personal information management apparatus, and by the computer of the personal information management apparatus reading the program code.

In this case, the program code read from the portable storage medium 146, etc. is to realize a new function of the present invention, and the portable storage medium 146, etc. storing the program code is to configure the present invention.

The portable storage medium 146 for providing a program code can be, for example, a flexible disk, a hard disk, an optical disk, a magneto-optical disk, CD-ROM, CD-R, DVD-ROM, DVD-RAM, a magnetic tape, a non-volatile memory card, a ROM card, various storage media recording data through the network connection device 148 (that is, a communications line) such as electronic mail, personal computer communications, etc.

Furthermore, as shown in FIG. 10, the functions of the above mentioned embodiments can be realized by executing a program code read by a computer 150 to memory 151, and an OS, etc. operating in the computer 150 performs all or a part of an actual process, and the process can realize the functions of the above mentioned embodiments.

In addition, after a program code read from a portable storage medium 152 or a program (data) 153 provided by a program (data) provider is written to

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Furthermore, the personal information management apparatus (personal agent) according to the present invention can select a rule based on which the personal information of a user can be selected from among: a rule of selecting the personal information depending on the using time; a rule of selecting the personal information depending on the path and method of accessing the network of the user terminal; a rule of selecting the personal information by referring to the personal information indicating the situation and status of the user personal information, etc. Therefore, the user can easily and almost unconsciously select the personal information in various situations.

The personal information management apparatus (personal agent) according to the present invention has a plurality of personal information management apparatuses (personal agents) for management of one set of personal information, and an integral personal information management apparatus (personal agent) integrally manages the personal information management apparatuses (personal agents). Therefore, the resources of the conventional personal information management apparatus (personal agent)

can be used as is, thereby omitting the installing step.

In the personal information management apparatus (personal agent), plural sets of personal information depend on each other. When a part of a set of personal information is changed, another set of personal information specified by the user can also be changed. The personal information synchronization function easily realizes collective management of personal information stored in a plurality of terminals.

Furthermore, the personal information management apparatus (personal agent) is provided in a server in a network, and the personal information can be managed by answering a request from a terminal. Therefore, the personal information among a plurality of terminals can be more easily and collectively managed.

Since the personal information management apparatus (personal agent) according to the present invention is directly provided for the terminal of the user, and access other terminals and personal information management apparatuses (personal agents), plural sets of personal information stored in a plurality of terminals can be easily and

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collectively managed almost unconsciously as to whether or not the terminal is connected to the network.

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